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Chen et al.

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(54) **FOLD DOWN WORK SURFACE FOR MOUNTING ON A WALL**

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(58) **Field of Classification Search** 108/134–135, 108/160, 152, 179, 42, 128, 132; 248/240, 248/240.4, 188.6
See application file for complete search history.

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(57) **ABSTRACT**

A folding work surface for mounting on a wall. The work surface includes a platform hinged to the wall. A pair of upper supports are pivotally connected to the platform and pivotally connected to a lower support. The lower support is then pivotally connected to the wall. A locking ring is positioned on each of the upper supports. A stop bracket is also included and has a base secured to the lower support and has a pair of locking tabs separately extending outwardly which extend along a portion of the upper supports. When the platform is in an opened position, the upper supports and the lower supports aligned to permit the locking rings to slide over the locking tabs securing the locking tabs against the upper supports and thereby locking the platform in the opened position.

11 Claims, 8 Drawing Sheets

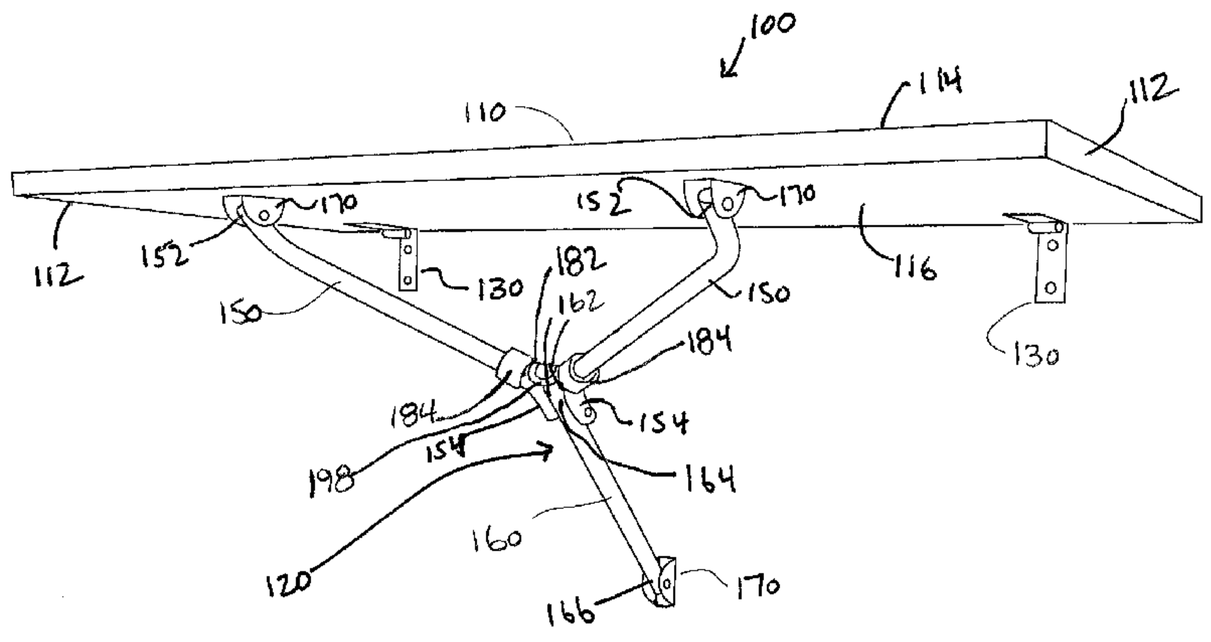

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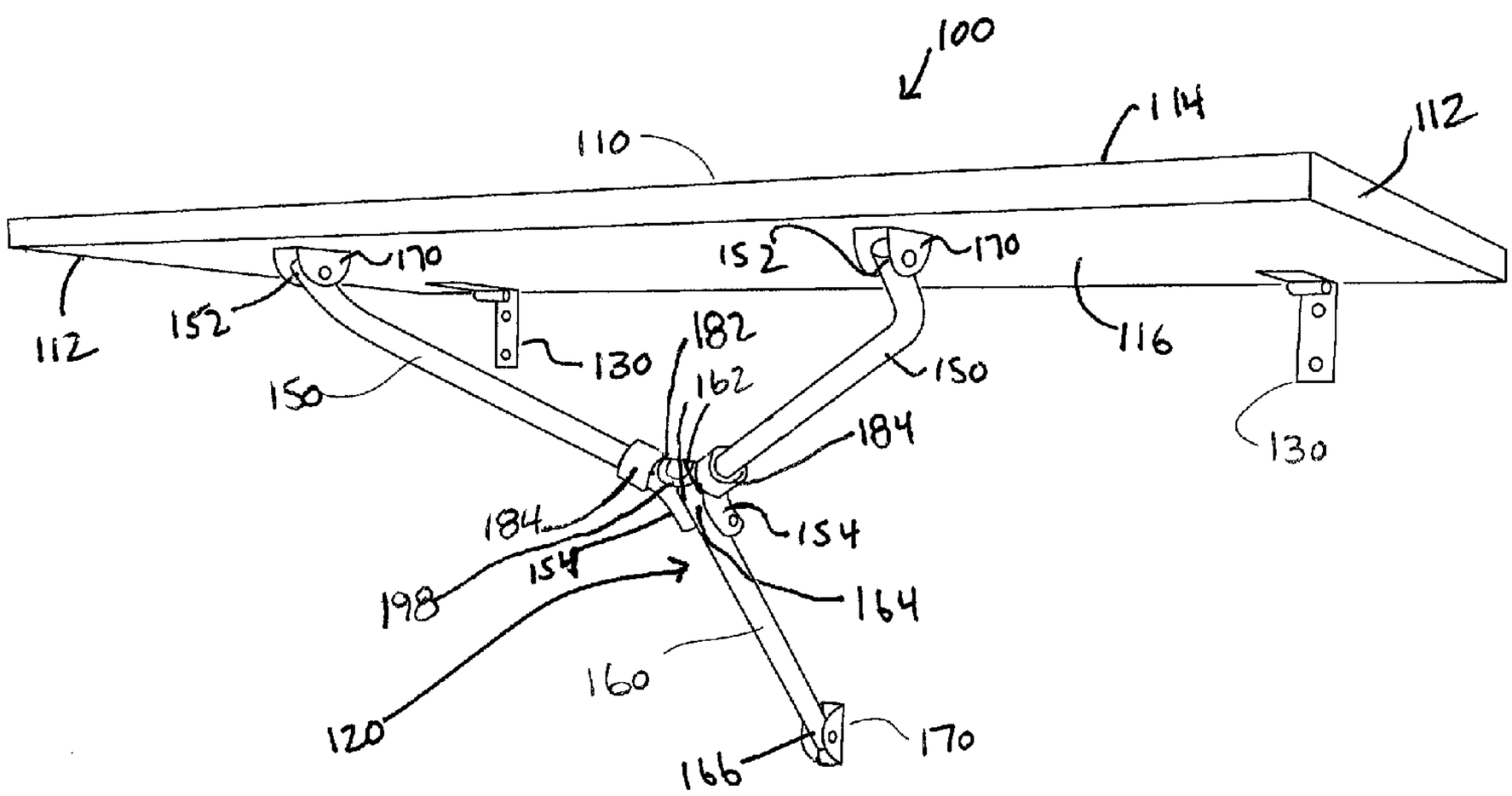
Figure 1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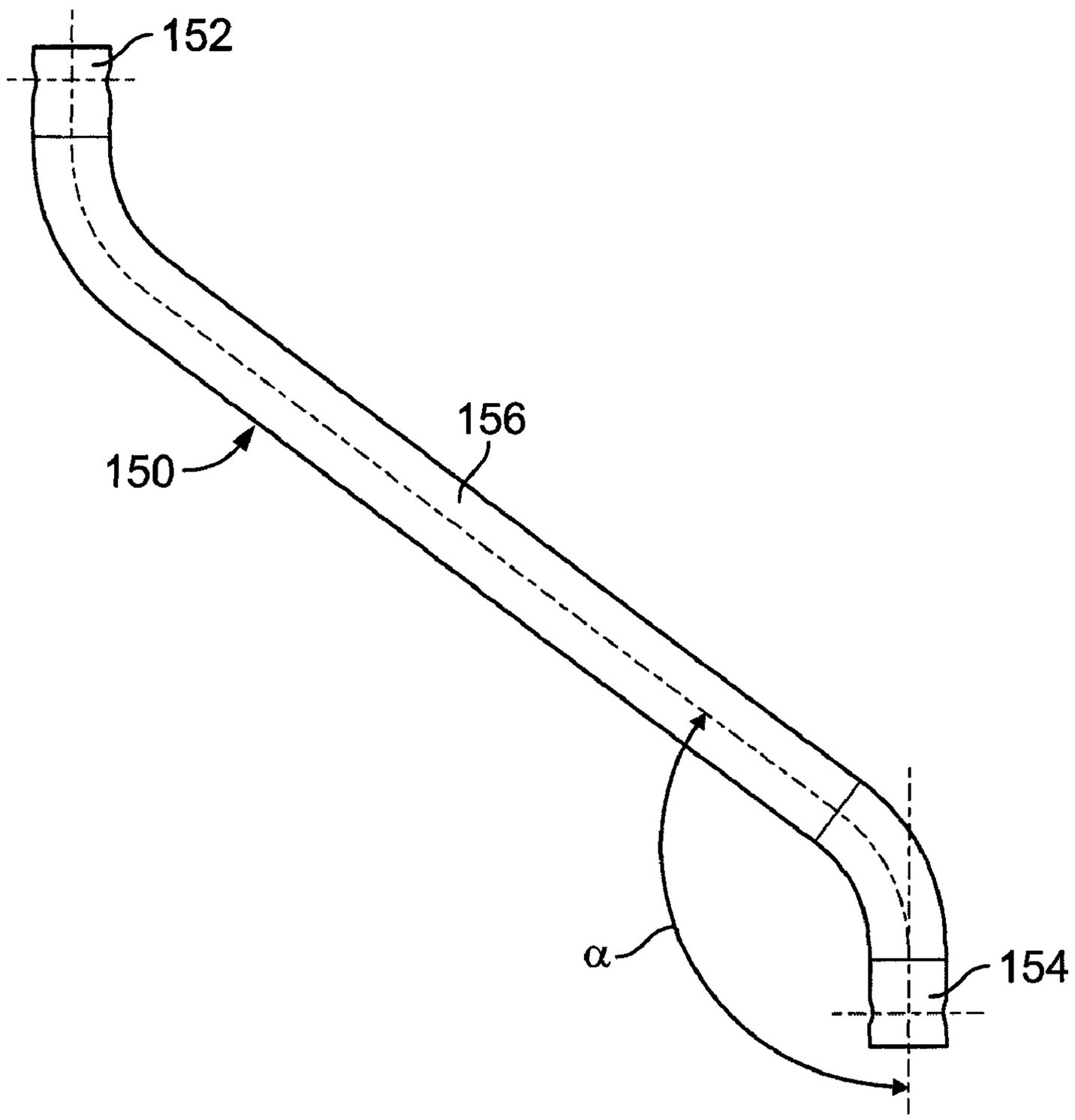

Figure 2A

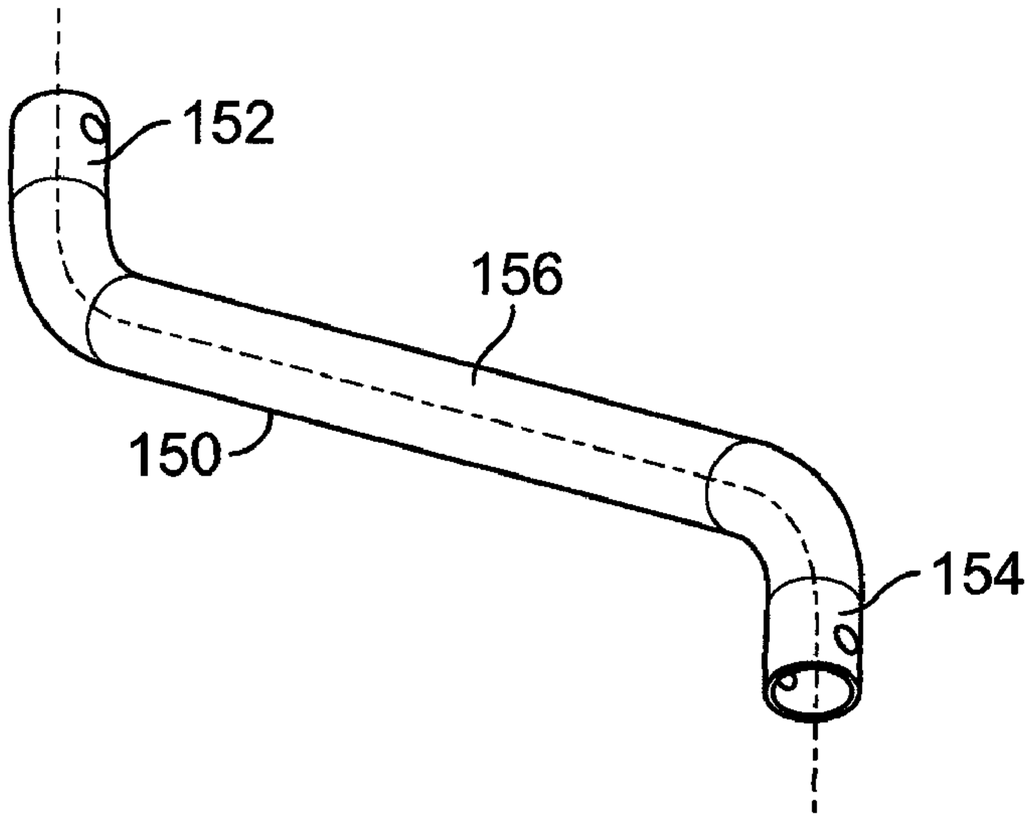

Figure 2B

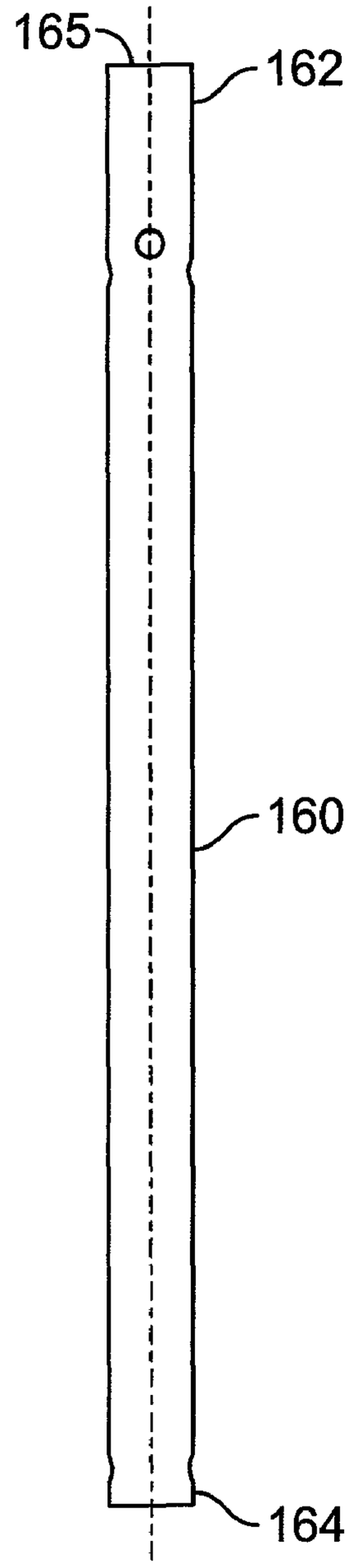

Figure 3A

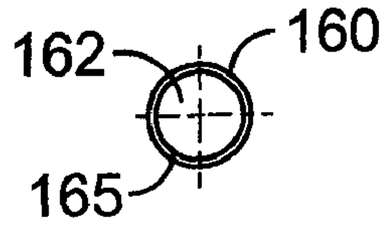

Figure 3B

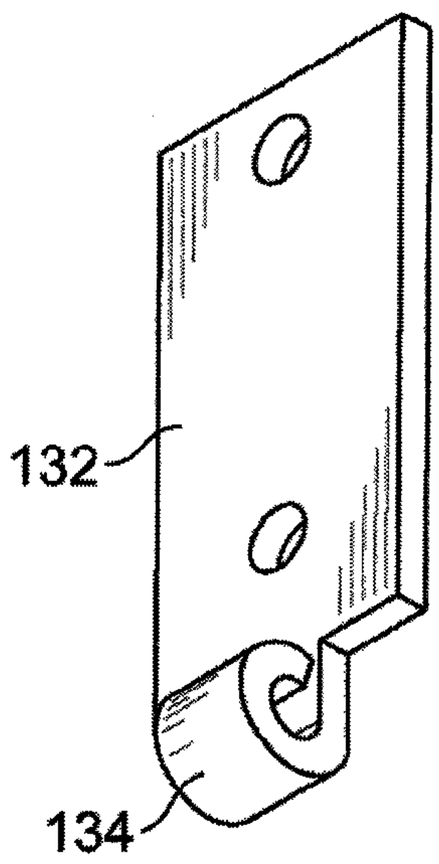

Figure 4A

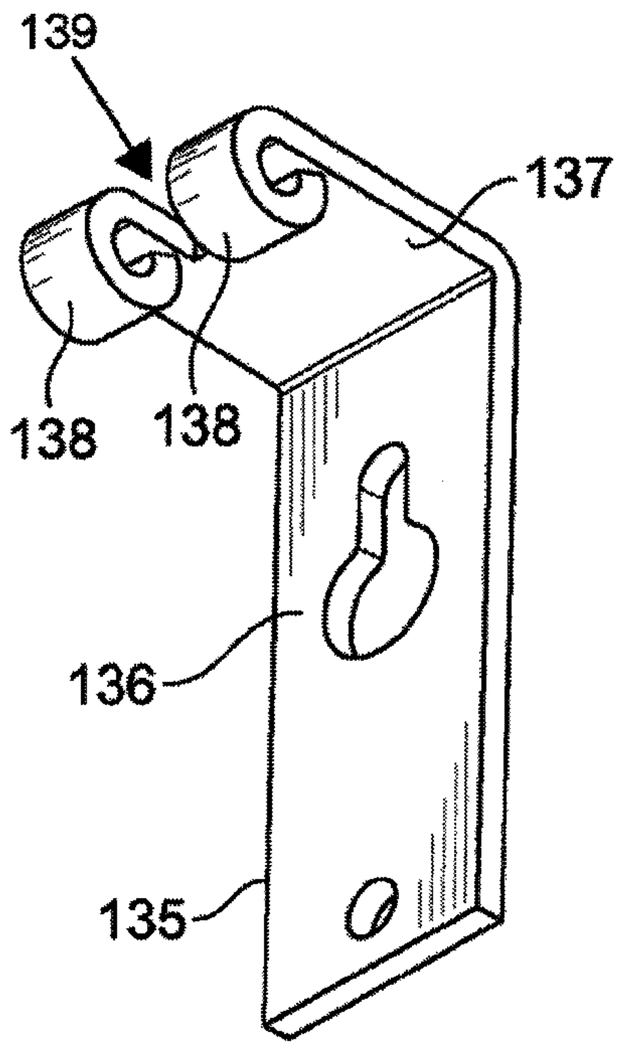

Figure 4B

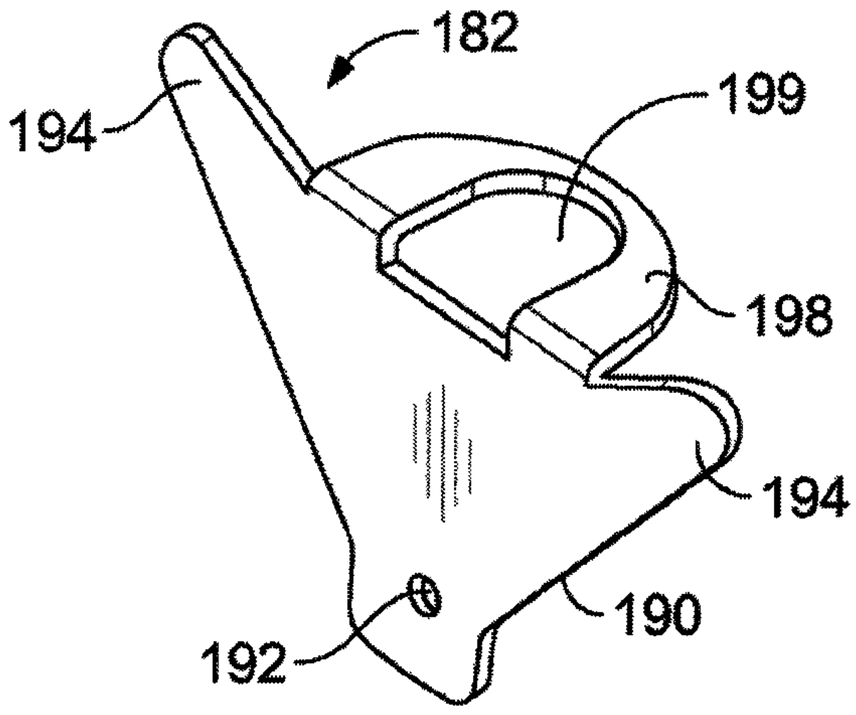

Figure 5

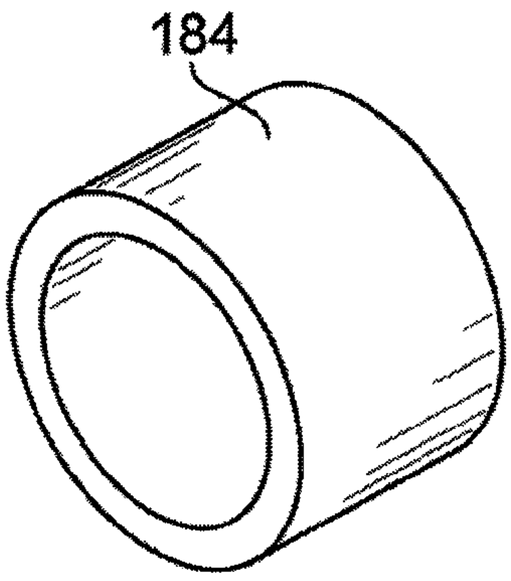

Figure 6

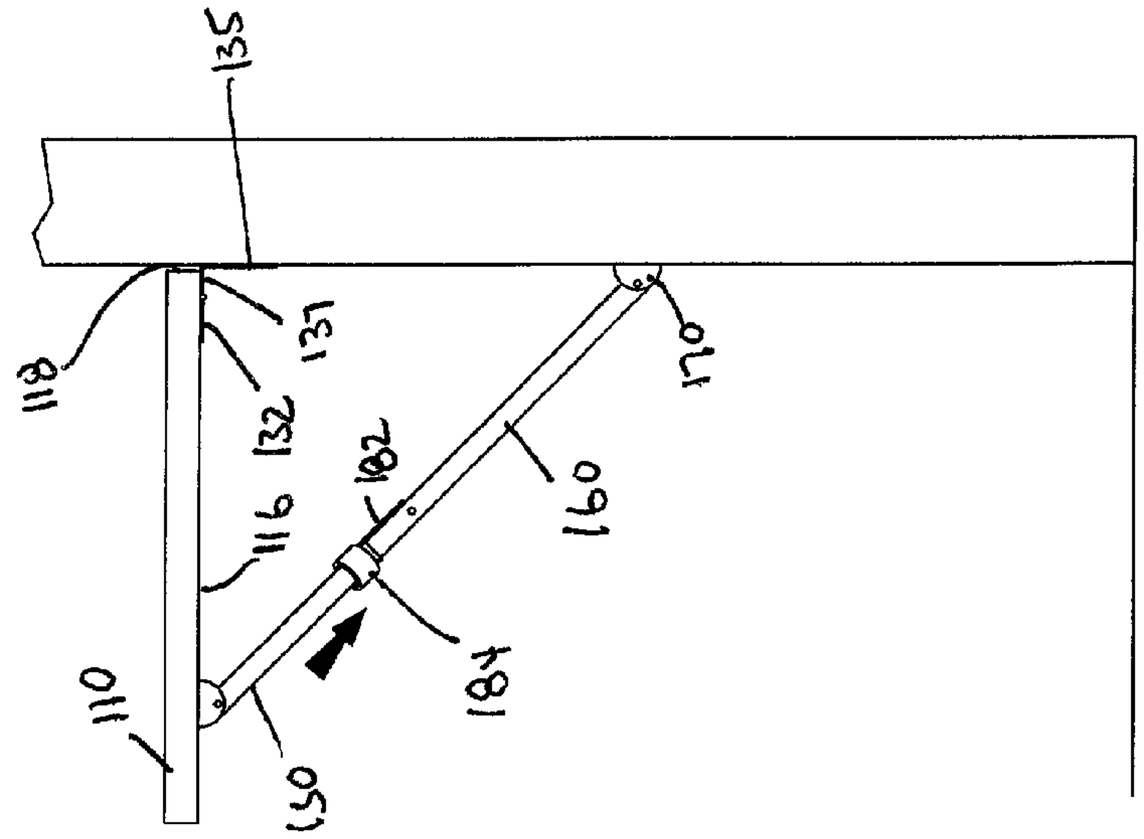

Figure 7c

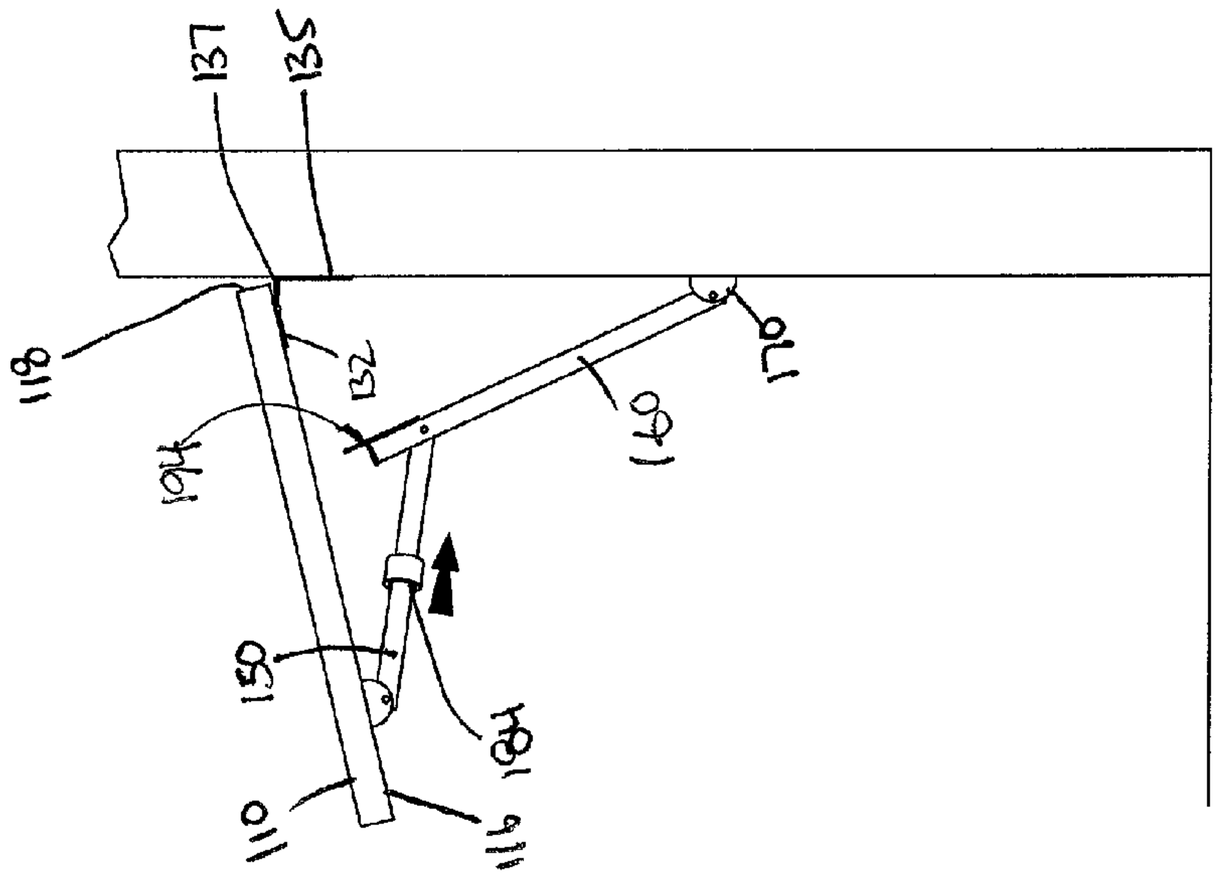

Figure 7b

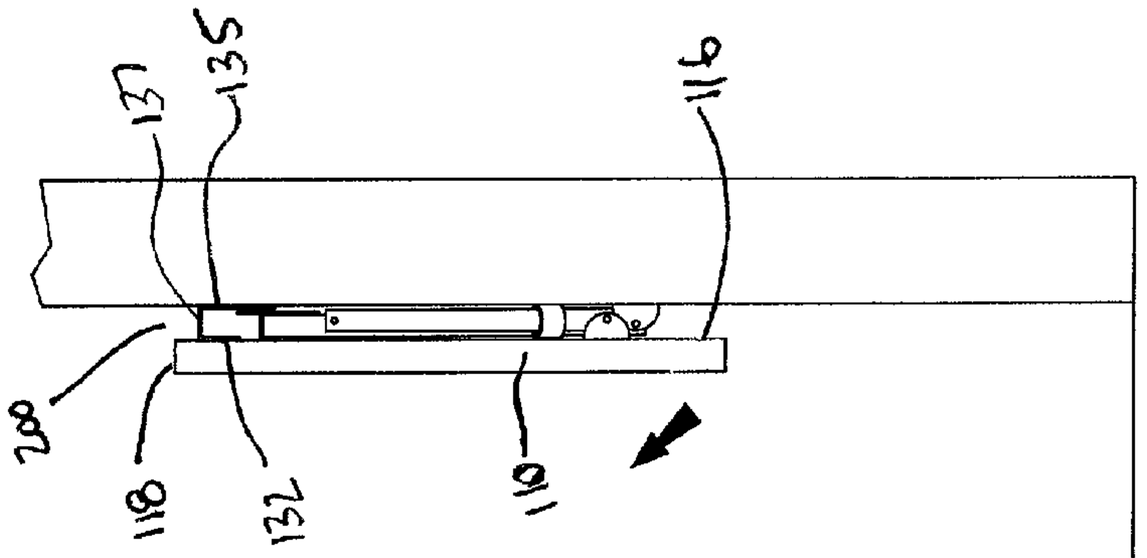

Figure 7a

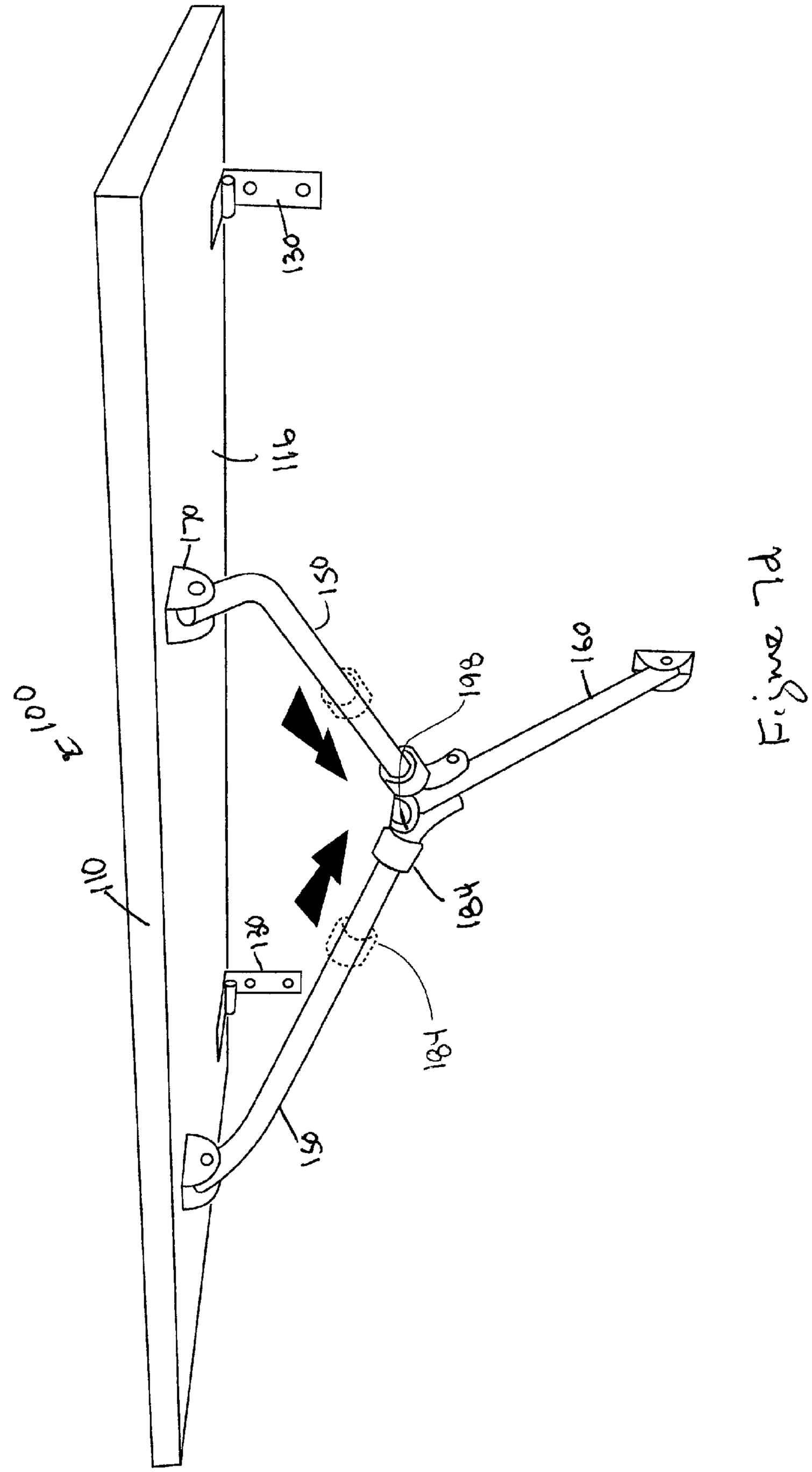

FIG. 7d

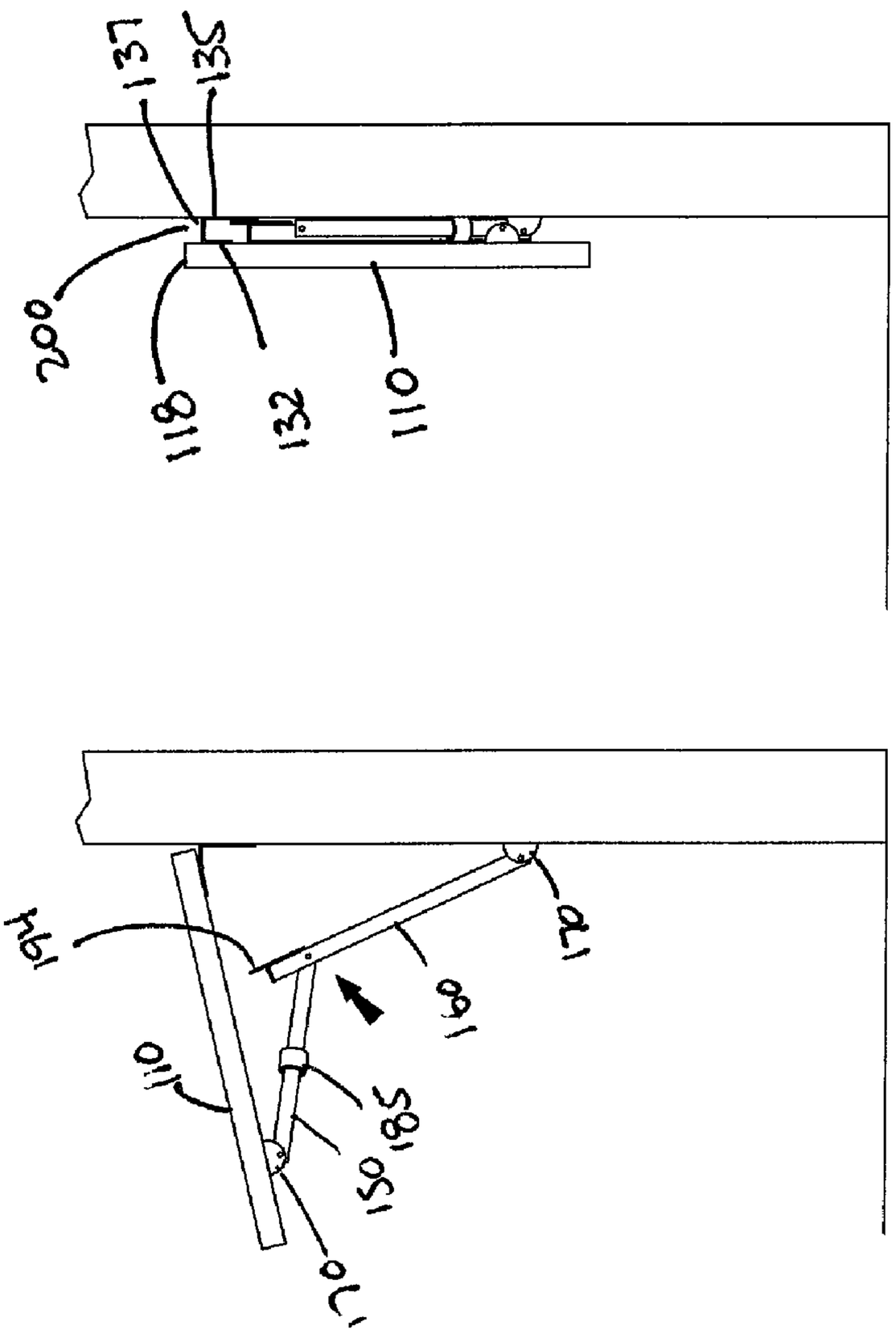

Figure 8c

Figure 8b

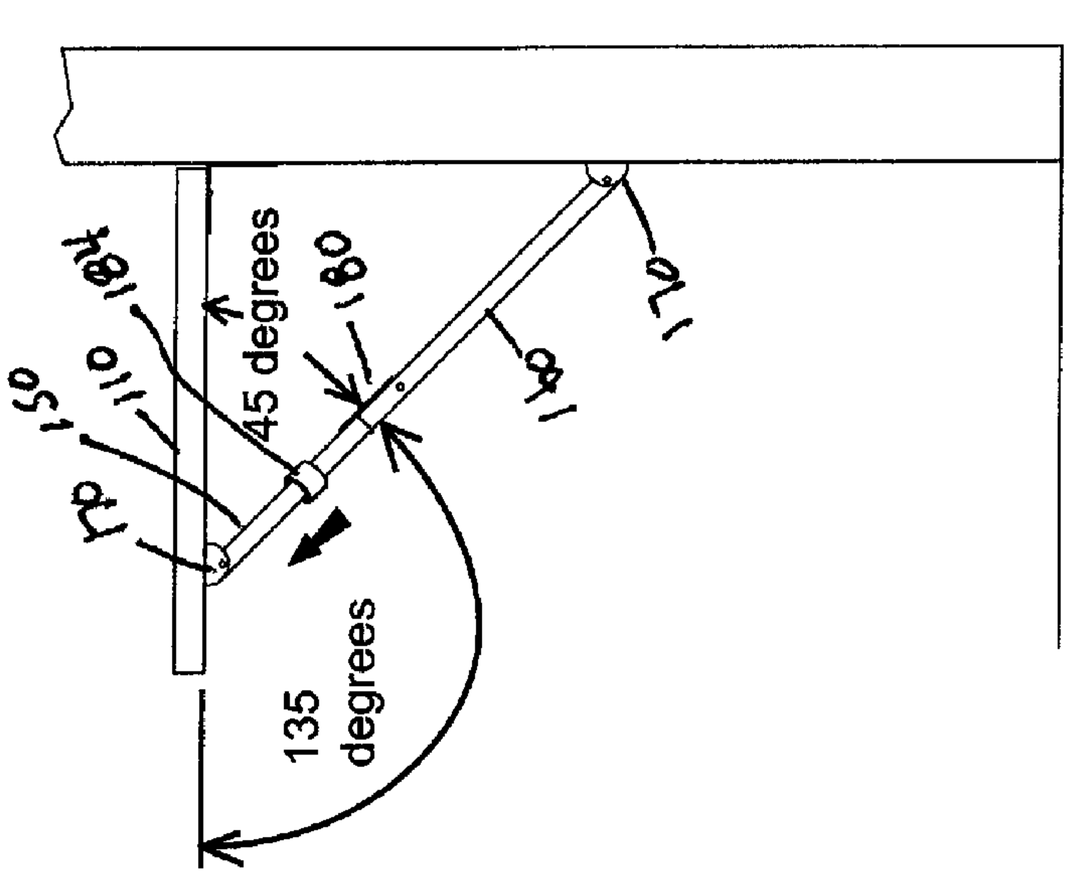

Figure 8a

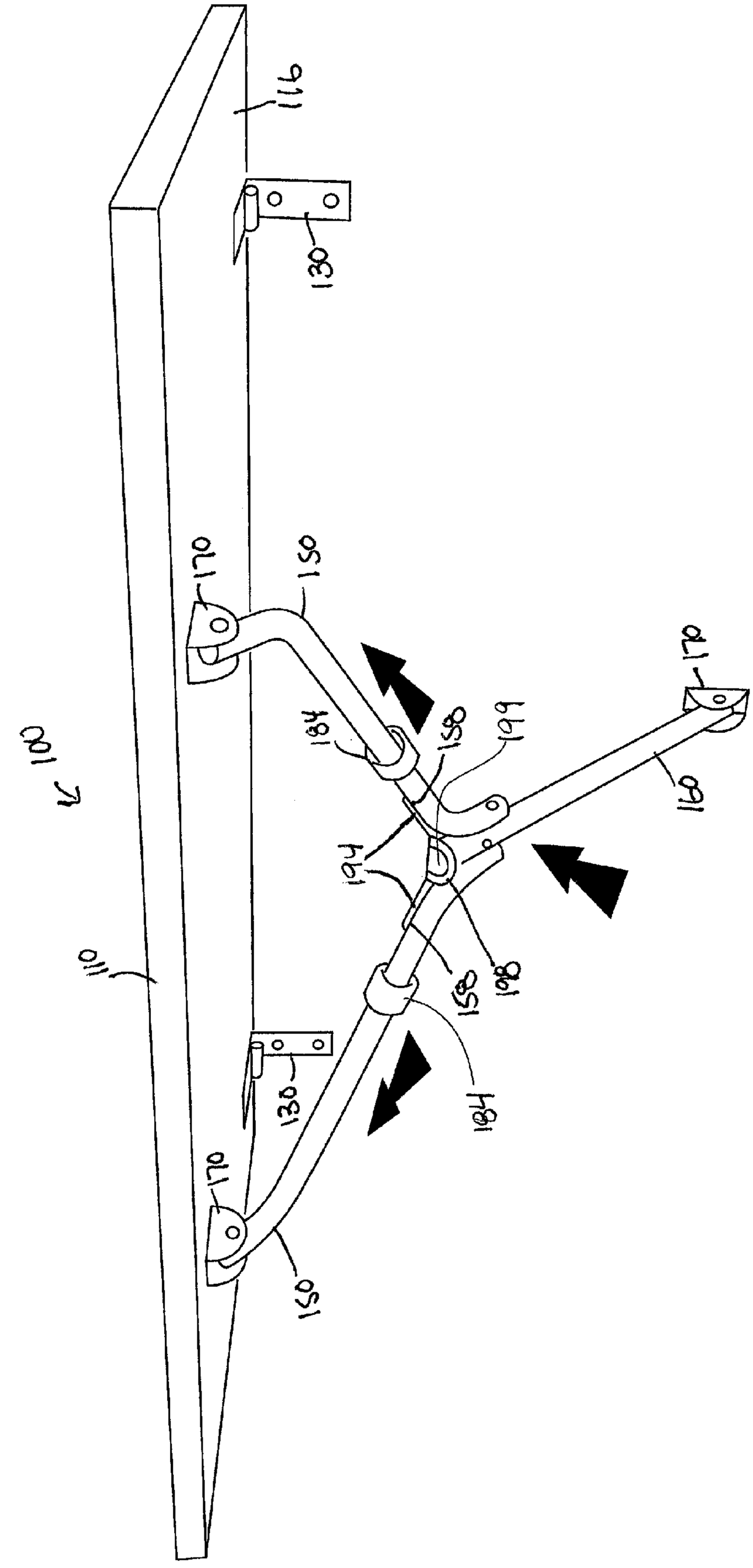
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Figure 8d

FOLD DOWN WORK SURFACE FOR MOUNTING ON A WALL

FIELD OF THE INVENTION

The present invention relates to a tables and work surfaces that mount to a wall and that may be folded down for convenient storage and for saving space.

BACKGROUND OF THE INVENTION

Folding tables are convenient for supporting things when needed and compacting for occupying a smaller space when not in use. There are numerous types of folding tables in the prior art each of which may hold distinct advantages over other types of designs. However, there is a continual need to develop new and improved designs.

SUMMARY OF THE INVENTION

In accordance with an embodiment of the present invention, a folding work surface for mounting on a wall is provided to include a platform; at least one hinge, having a first section mounted to a bottom surface of the platform and having a second section hingedly connected to the first section and mounted to the wall; a pair of upper supports, each having an first end separately secured by a pivot bracket to the bottom surface of the platform, each upper support further having a second end; a lower support having a first end secured by a pivot bracket to the wall and having a second end, and wherein the second end of each of the upper supports is pivotally secured to a side region of the second end of the lower support; a pair of locking rings separately positioned on each of the upper supports, each of the locking rings having an opening defined to permit the locking rings to slide over the upper supports; and a stop bracket having a base secured to the second end of the of the lower support and having a pair of locking tabs separately extending outwardly from sides of the base to extend along a portion of the second end of the upper supports, wherein when the platform is in a substantially horizontal position defining an opened position, the upper supports and the lower supports are aligned to permit the pair of locking rings to slide over the locking tabs securing the locking tabs against the upper supports thereby locking the platform in the opened position.

In another aspect of the embodiment, a closed position if defined when the locking rings are slid away from the locking tabs, such that the upper supports and the lower supports are movable towards the wall allowing the platform to move to a substantially vertical position that hides the upper and lower supports.

In another aspect of the embodiment the second section of the hinge further includes a first portion that secures to the wall and a second portion that is angled away from the first portion and that is hingedly connected to the first section of the hinge at an end distal to the first portion, wherein when the work surface is in the closed position, the bottom surface of the platform is positioned a distance from the wall defined by the length of the second portion of the second section of the hinge.

In yet another aspect of the embodiment, each of the upper supports includes a middle section which curves at an angle in opposite directions at its distal ends to form the first and second ends. The angle of curvature defined at the ends of the upper support may be between 120 and 130 degrees.

In yet still another aspect of the embodiment, the stop bracket further includes a flange angled from the base and positioned to rest against an edge defined by the first end of the lower support.

Numerous other advantages and features of the invention will become readily apparent from the following detailed description of the invention and the embodiments thereof, from the claims, and from the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

A fuller understanding of the foregoing may be had by reference to the accompanying drawings, wherein:

FIG. **1** is a front perspective view of a fold down work surface in accordance to an embodiment of the invention, illustrating an opened position;

FIG. **2***a* is a side view of an upper support used in an embodiment of the invention;

FIG. **2***b* is a perspective view of FIG. **2***a;*

FIG. **3***a* is a side view of a lower support used in an embodiment of the invention;

FIG. **3***b* is an end view of the lower support from FIG. **3***a;*

FIG. **4***a* is a perspective view of a first section of a two-sectioned hinged used in an embodiment of the invention;

FIG. **4***b* is a perspective view of a second section of the two-sectioned hinged;

FIG. **5** is a perspective view of a stop bracket used in combination with other components in a means to lock the fold down work surface in an opened position and in accordance with an embodiment of the invention;

FIG. **6** is a locking ring used with the stop bracket to lock the fold down work surface in the opened position;

FIGS. **7***a*-**7***d* are views showing a fold down work surface being moved from a closed position to the opened position; and

FIGS. **8***a*-**8***d* are views showing a fold down work surface being moved from an opened position to the closed position.

DESCRIPTION OF THE EMBODIMENTS

While the invention is susceptible to embodiments in many different forms, there are shown in the drawings and will be described herein, in detail, the preferred embodiments of the present invention. It should be understood, however, that the present disclosure is to be considered an exemplification of the principles of the invention and is not intended to limit the spirit or scope of the invention and/or claims by the embodiments illustrated.

Referring now to FIG. **1**, there is shown generally a fold down work surface **100** held in an upright and locked position. The fold down work surface **100** comprises a work surface assembly of components that include a platform **110** a support assembly **120** and at least one hinge **130** that secures the platform **110** to a wall or other vertical surface. In the embodiment illustrated, the work surface assembly includes a pair of hinges **130** separately positioned about ends **112** of the platform **110**.

The platform **110** has a top surface **114** and a bottom surface **116**. The bottom surface **116** is used for the connection of the at least one hinge **130**. The platform may be made of any material and sized appropriately for any particular purpose.

The support assembly **120** includes a pair of upper supports **150** that are joined to a lower support **160**. The first ends **152** of the upper supports **150** are attached to the bottom surface **116** of the platform **110** by pivot brackets **170**. The second ends **154** of the upper supports **150** are attached to the sides

162 of a first end **164** of the lower support **160**. The second end **166** of the lower support **160** is lastly attached to the wall or vertical surface by a pivot bracket **170**.

As further described below, the junctions of the upper supports **150** to the lower support **160** includes a means for locking **180** the supports in position. The locking means **180** includes a stop bracket **182** and a pair of locking rings **184**.

Referring now to FIGS. **2***a*-**6**, the individual components will be more fully described where necessary. The upper supports **150** include a middle section **156** which curves towards its ends to form the first end **152** and to form the second end **154**. The angle of curvature a is preferably about 115 to 140 degrees, but may be further defined at about 120 to 130 degrees, at in one embodiment was positioned at about 126 degrees. The lower support **160** may simply be a substantially straight support without any need for curved sections.

The hinges **130** may be defined into a two sectioned hinge. The first section **132** secures directly to the bottom surface **116** of the platform **110** and includes at least one fastening hole and a curved portion **134** defined at one end. The second section **135** of the two sectioned hinge includes a first portion **136** that secures to the wall by at least one fastening hole. The second section **135** further includes a second portion **137** that is angled away from the first portion **136**. The second portion **137** includes a pair of curved portions **138** separated by a space **139** sized to receive the curved portion **134** defined at the end of the first section **132**. All of the curved portions **138** and **134** are aligned during assembly as secured in place by a pin that permits the two sectioned hinge to pivot such that the platform **110** may move to and from the closed and opened position.

As mentioned above, the locking means **180** includes a stop bracket **182** secured to the first end **162** of lower support **160** substantially adjacent to the region where the upper supports **150** attach to the lower support **160**. The stop bracket **182** includes a base **190** with an aperture **192** for attaching the stop bracket **182** to the first end **162** of the lower support **160**. Any type of fastener can be used to secure the stop bracket **182** against the lower support **160**. A pair of locking tabs **194** extend outwardly in the form of wings from the base **190**. Positioned between the locking tabs **194** near a top portion **196** of the base **190** is a flange **198**. The flange **198** extends outwardly from the top portion **196** and is designed to be positioned against an edge **165** defined at the first end **162** of the lower support **160**. The flange **198** may be U shaped and define an opening **199** between the closed section of the U-shape and the top portion **196** of the base.

During assembly, the hinges **130** and the brackets **170** are secured to the wall and the bottom surface **116** of the platform **110**. The upper supports **150** and the lower support **160** are then secured to the brackets and the locking rings **184** are positioned onto the upper supports **150** prior to securing the ends of the upper supports **150** to the lower support **160**. The stop bracket **184** can then be secured to the lower support **160**. The manner in which the fold down work surface is assembled may change without changes the scope and spirit of the invention.

Referring now to FIGS. **7**-**8***d*, once the fold down work surface is assembled, the work surface may be moved to the closed or opened position. As illustrated in FIG. **7***a*, from the closed position, the two sectioned hinge **130** positions the platform **110** away from the wall such that the upper and lower supports can fold and hide nicely between the platform and the wall. In addition, the two sectioned hinge **130** having the second portion **137** defined on the second section **135** that is angled away from the first portion **136** defined a gap **200** between the bottom surface **116** and the wall such that when the platform is moved to the opened position (FIGS. **7***b* and **7***c*), the rear end **118** of the platform **110** can move to become nearly adjacent against the wall.

In addition, it is understood that the placement of the hinge **130** can be made such that the rear end **118** comes into contact with the wall when the platform is moved to the opened position. The gap **200** is defined by a length of the second portion **137** of the second section **135** of the hinge. While the length may be predetermined to define a specific distance, in different embodiments the length of the gap varied from about ¼ to about 1 inch.

In addition, when the fold down work surface **100** is moved to the opened position, the locking tabs **194** on the stop bracket **182** will come into contact with regions **158** defined on the upper supports **150** (best illustrated in FIG. **8***d*). As the fold down work surface is being moved, gravity will cause the locking rings **184** to move downwardly towards the lower support **160** (FIG. **7***b*) and will slip over the locking tabs **194** (FIG. **7***c* and **7***d*) thereby locking the fold down word surface into place.

In order to move the fold down work surface to the closed position (FIGS. **8***a*-**8***c*), the locking rings **184** are moved upwardly and a force is applied to the first end of the lower support near the region where the upper supports are attached to the lower support. At this point the platform **110** can be easily moved to the closed position.

As further illustrated in FIG. **8***a*, in the opened position the fold down work surface may be assembled such that the angle between the platform and the upper supports as between 40-50 degrees, and more preferably about 45 degrees.

From the foregoing and as mentioned above, it will be observed that numerous variations and modifications may be effected without departing from the spirit and scope of the novel concept of the invention. It is to be understood that no limitation with respect to the specific methods and apparatus illustrated herein is intended or should be inferred. It is intended to cover by the appended claims all such modifications as fall within the scope of the claims.

We claim:

1. A folding work surface for mounting on a wall, the work surface comprising:

a platform;

at least one hinge, having a first section mounted to a bottom surface of the platform and having a second section hingedly connected to the first section and adapted to be mounted to the wall;

a pair of upper supports, each having a first end separately secured by a pivot bracket to the bottom surface of the platform, each upper support further having a second end;

a lower support having a first end adapted to be secured by a pivot bracket to the wall and having a second end, and wherein the second end of each of the upper supports is pivotally secured to a side region of the second end of the lower support;

a pair of locking rings separately positioned on each of the upper supports, each of the locking rings having an opening defined to permit the locking rings to slide over the upper supports; and

a stop bracket having a base secured to the second end of the of the lower support and having a pair of locking tabs separately extending outwardly from sides of the base to extend along a portion of the second end of the upper supports,

wherein when the platform is in a substantially horizontal position defining an opened position, the upper supports and the lower supports are aligned to permit the pair of

locking rings to slide over the locking tabs securing the locking tabs against the upper supports thereby locking the platform in the opened position.

2. The work surface of claim **1**, wherein when the locking rings are slid away from the locking tabs, the upper supports and the lower supports are movable towards the wall such that the platform can move to a substantially vertical position defining a closed position that hides the upper and lower supports.

3. The work surface of claim **2**, wherein the second section of the hinge further includes a first portion that securable to the wall and a second portion that is angled away from the first portion and that is hingedly connected to the first section of the hinge at an end distal to the first portion, wherein when the work surface is in the closed position, the bottom surface of the platform is positioned a distance from the wall defined by the length of the second portion of the second section of the hinge.

4. The work surface of claim **3**, wherein each of the upper supports includes a middle section which curves at an angle in opposite directions at its distal ends to form the first and second ends.

5. The work surface of claim **4**, wherein the angle of curvature defined at the ends of the upper support is preferably between 120 and 130 degrees.

6. The work surface of claim **1**, wherein the stop bracket further includes a flange angled from the base and positioned to rest against an edge defined by the first end of the lower support.

7. A folding work surface for mounting on a wall, the work surface comprising:

a platform;

at least one hinge connected to a bottom surface of the platform and adapted to be connected to the wall, such that the platform is hingedly connected to the wall;

a pair of upper supports, each having a first end separately secured by a pivot bracket to the bottom surface of the platform, each upper support further having a second end, and wherein each of the upper supports includes a middle section which curves at an angle in opposite directions at its distal ends to form the first and second ends;

a lower support having a first end adapted to be secured by a pivot bracket to the wall and having a second end, and wherein the second end of each of the upper supports is pivotally secured to a side region of the second end of the lower support;

a pair of locking rings separately positioned on each of the upper supports, each of the locking rings having an opening defined to permit the locking rings to slide over the upper supports; and

a stop bracket having a base secured to the second end of the of the lower support and having a pair of locking tabs separately extending outwardly from sides of the base to extend along a portion of the second end of the upper supports,

wherein when the platform is in a substantially horizontal position defining an opened position, the upper supports and the lower supports are aligned to permit the pair of locking rings to slide over the locking tabs securing the locking tabs against the upper supports thereby locking the platform in the opened position.

8. The work surface of claim **7**, wherein when the locking rings are slid away from the locking tabs, the upper supports and the lower supports are movable towards the wall such that the platform can move to a substantially vertical position defining a closed position that hides the upper and lower supports.

9. The work surface of claim **7**, wherein the at least one hinge is further defined as having:

a first section mounted to the bottom surface of the platform, and

a second section hingedly connected to the first section and adapted to be mounted to the wall, the second section further including a first portion that securable to the wall and a second portion that is angled away from the first portion and that is hingedly connected to the first section of the hinge at an end distal to the first portion, wherein when the work surface is in the closed position, the bottom surface of the platform is positioned a distance from the wall defined by the length of the second portion of the second section of the hinge.

10. The work surface of claim **7**, wherein the angle of curvature defined at the ends of the upper support is preferably between 120 and 130 degrees.

11. The work surface of claim **7**, wherein the stop bracket further includes a flange angled from the base and positioned to rest against an edge defined by the first end of the lower support.

* * * * *